This appeal to engineering highlights the fact that mechanisms perform different functions than their components and emphasizes the importance of organization of parts and operations in accomplishing the new function. If the engineer relied on off-the-shelf components in building her mechanism, then the only thing she added was organization. It is the only thing she added, but it is far from trivial. It is for discovering the way to organize parts and operations that the engineer earns her patent. But there is a further factor that successful engineers take into account – the context in which the mechanism performs its function. One common way in which engineered products fail is when they are put into operation in contexts other than those for which they were designed. The wrong context can hinder a mechanism's operation whereas the appropriate context may provide things which are co-opted in the mechanism's operation. This is even more true of biologically evolved mechanisms than humanly engineered ones. Evolution is an opportunist, and if something can be relied upon in the mechanism's environment, then it doesn't have to be generated by the mechanism. Vitamins provide just one well-known example. Because our ancestors could generally count on the availability of vitamins in their foods, there was no evolutionary pressure for us to retain the ability to synthesize them. Insofar, however, as such environmental factors are necessary for the functioning of the mechanism, mechanistic explanations need to focus on the mechanism's context, not just its internal configuration.

6. ORGANIZATION: FROM CARTESIAN TO BIOLOGICAL MECHANISMS

I described previously how, in reviving the mechanical philosophy, Salmon significantly expanded the toolbox of features in terms of which mechanisms could be understood. Instead of just shape and motion (Descartes' features), modern mechanists can appeal to such things as gravitational and electromagnetic fields. In biology the comparable expansion brings in chemical bonds and catalysis. But biological mechanisms require expanding the toolbox Descartes supplied in yet a different way, one that focuses on organization of parts and operations. The appeal to engineering showed how organization enables a mechanism to perform functions which its parts alone cannot, but the organization of biological systems is distinctively different from the organization typically exhibited in humanly engineered systems. When humans think of putting components together we usually think of linking them together in series so that each component operation sends its product to the next component operation in the series. From biological systems, however, we have